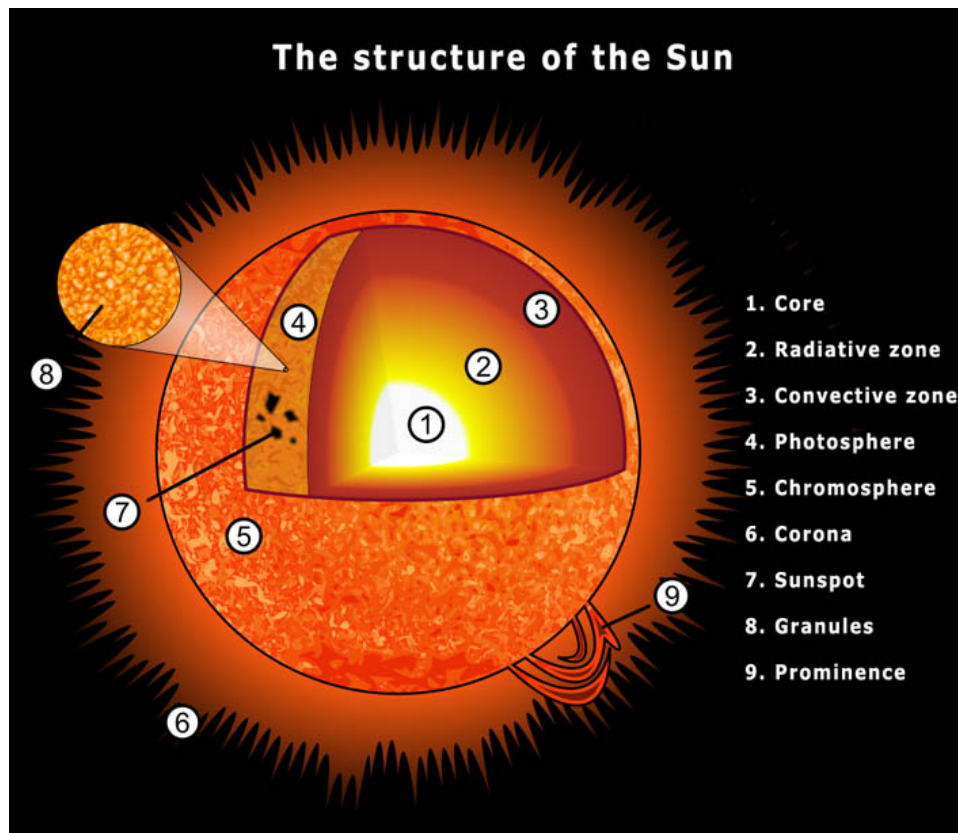


Our Misunderstood Sun – holoscience.com | The ELECTRIC UNIVERSE®



“We stand on the verge of a vast cosmical discovery such as nothing hitherto imagined can compare with.”

—Sir John Herschel in 1850, upon the discovery of a link between magnetic storms on Earth and sunspots, to Michael Faraday, the vaunted experimentalist who was investigating the links between electricity and magnetism.



Sir John Herschel from 1846 *The Year-book of Facts in Science and Art* By John Timbs, London: Simpkin, Marshall, and Co.

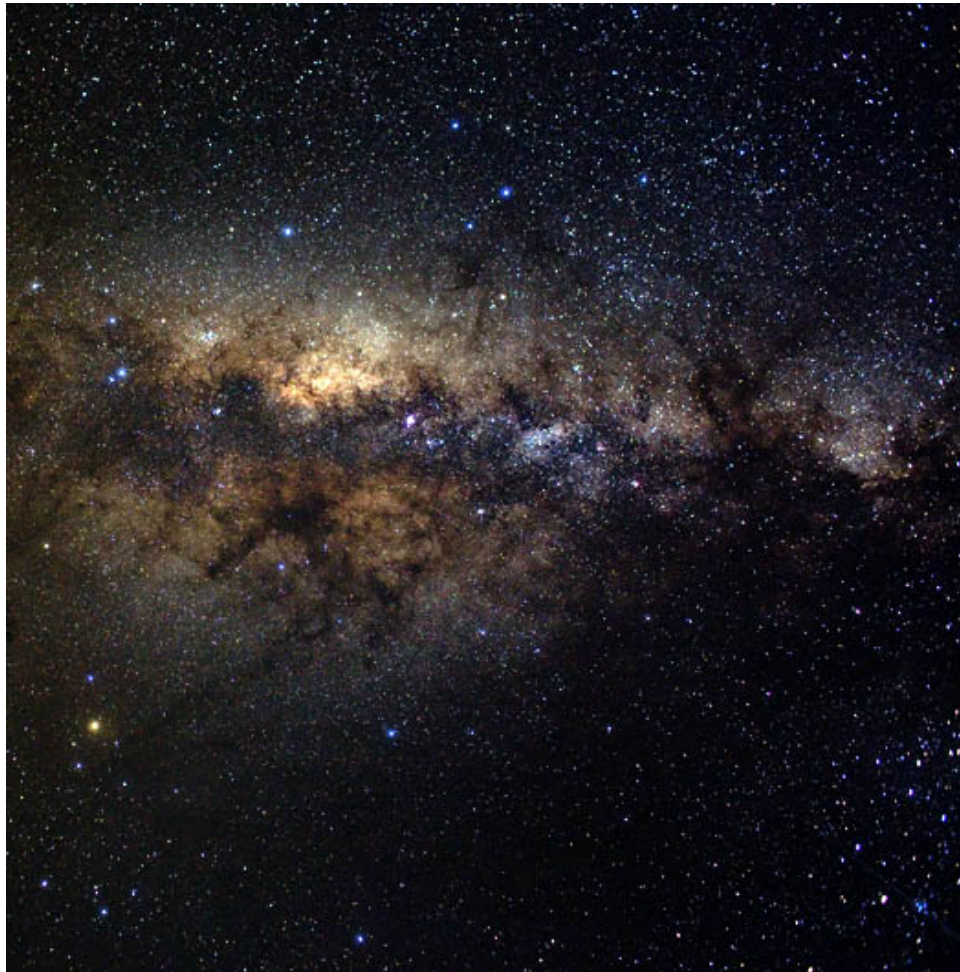
Incredibly, one hundred and sixty years later in the space age, Herschel's "vast cosmical discovery such as nothing hitherto imagined can compare with," of an ELECTRIC UNIVERSE®, remains "on the verge." Mistaken ideas have diverted scientists down the path of Ptolemy once more, adding endless epicycles to theory to save appearances. Meanwhile the object central to the problem is the same and in full view. It is our misunderstood Sun.

"The modern astrophysical concept that ascribes the sun's energy to thermonuclear reactions deep in the solar interior is contradicted by nearly every observable aspect of the sun."
—*Ralph E. Juergens (1980)*

This year is going to be very busy publicizing the ELECTRIC UNIVERSE® in England and Australia while receiving an award from a European Academy of Science for the work. So my articles will probably be sparser as I attend to other demands this year. Meanwhile, observational support for the ELECTRIC UNIVERSE® arrives almost

daily in the scientific press and my friends and colleagues at thunderbolts.info provide an up-to-date resource for those following this adventure.

Astronomers in the Dark



The Milky Way is a blazing spectacle in the southern hemisphere sky. The stars remind me of a high school experiment in a darkened room; the radiant pinpoints of light appearing on the glass walls of an electric discharge tube as a near vacuum is reached inside the tube. It provides an exciting alternative perspective of the cosmos that is denied to almost everyone because it is 'off the map' of our education. Nowhere in any astronomy textbook or magazine will you find mention of electric discharge in space. The concept of electrically powered stars is never considered. Plasma science was in its infancy and nuclear energy the new sensation when the mathematical physicist Arthur Eddington (1882-1944) wrote *The Internal Constitution of the Stars* (1926). His theoretical work in stellar physics seemed to solve the puzzles of powering the Sun for billions of years and how the Sun could remain so huge against the tendency to collapse due its own strong gravity.



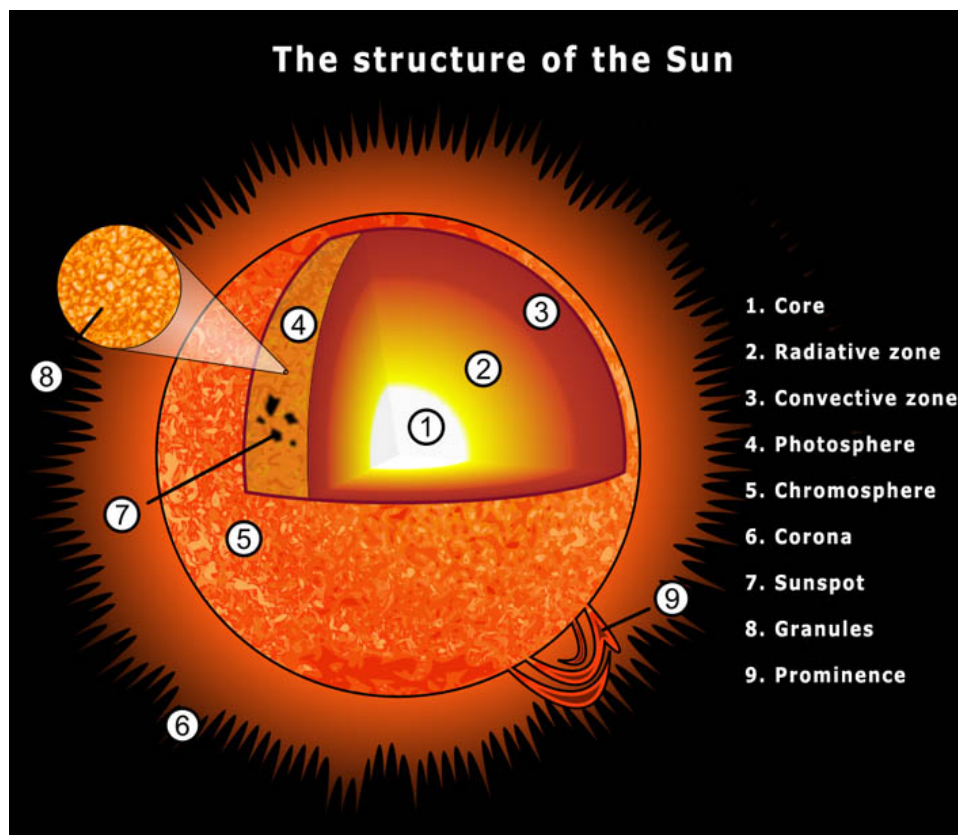
"It is not enough to provide for the external radiation of the star. We must provide for the maintenance of the high internal temperature, without which the star would collapse."

—A. Eddington, *The Internal Constitution of the Stars*

But this constraint arises from the peculiar self-gravitating gas model Eddington chose and not the star. None of the myriad bizarre phenomena seen on and above the photosphere are explained by his purely theoretical solution to the problem. A balance between gravitational attraction and inflating thermal energy does not determine the size of the Sun. That is why star sizes vary by at least ± 10 percent from the theoretical (see later). A photosphere is a brilliant electrical discharge phenomenon, which is little influenced by the physical size of the star hidden within.

“The problem of the source of a star’s energy will be considered; by a process of exhaustion we are driven to conclude that the only possible source of a star’s energy is subatomic; yet it must be confessed that the hypothesis shows little disposition to accommodate itself to the detailed requirements of observation, and a critic might count up a large number of ‘fatal’ objections.”
—A. Eddington, *The Internal Constitution of the Stars*.

Perhaps because of Eddington’s influence, his intolerance of criticism and lack of an alternative theory, no “fatal objections” were raised. The development of Eddington’s theories was ruled more by mathematical aesthetics than empirics. Somehow an explosive nuclear energy source in the core had to be initiated and then tamed. The lethal radiation from the core needed to be contained and ‘cooled’ by collisions in a so-called radiative zone inside the Sun. After about 171,000 years, on average, the more benign energy is transferred to space by convection and subsequent radiation. There is no experimental confirmation of such a bizarre body composed principally of hydrogen, transferring energy internally by radiation, or of the hypothetical thermonuclear reactions at its core. Observations of the Sun are forced to fit the model and anomalies abound.



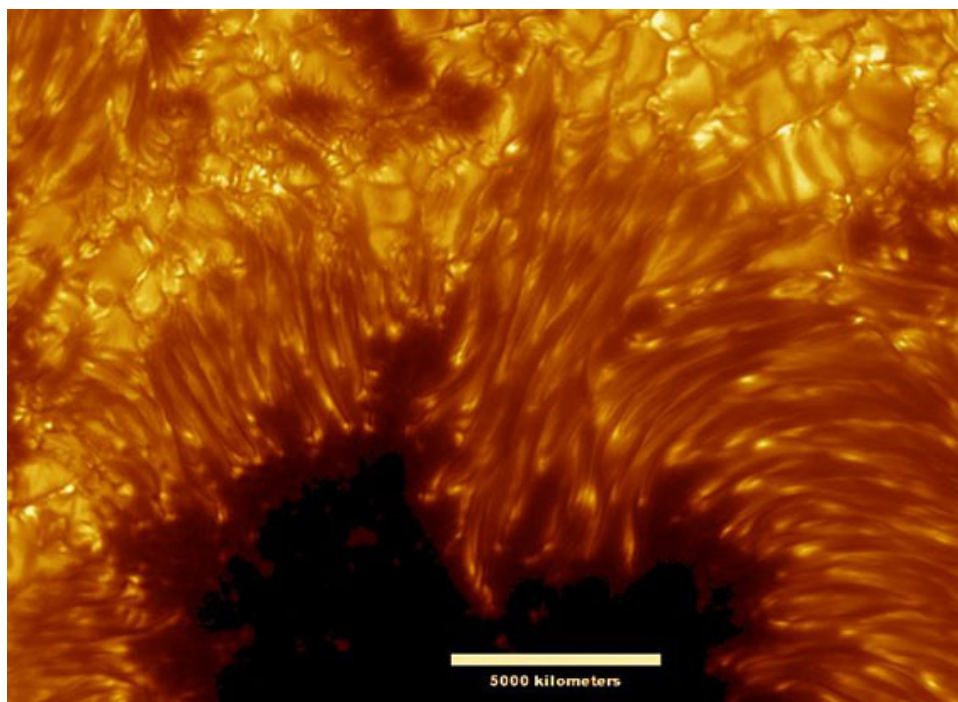
This simple diagram of the hypothetical standard solar model gives no inkling of the complexity of the phenomena seen in the photosphere and above. Image courtesy of Wikimedia Commons.

“We should expect on the basis of a straightforward calculation that the Sun would ‘end’ itself in a simple and rather prosaic way; that with increasing height above the photosphere the density of the solar material would decrease quite rapidly, until it became pretty well negligible only two or three kilometres up ... Instead, the atmosphere is a huge bloated envelope.”

—F. Hoyle, *Frontiers of Astronomy*

“Essential to the received theory is the conviction that inside the sun is a steep temperature gradient, falling toward the photosphere, along which the internal energy flows outward. If we stack this internal temperature gradient against the observed temperature gradient in the solar atmosphere, which falls steeply inward, toward the photosphere, we find we have diagrammed a physical absurdity: The two gradients produce a trough at the photosphere, which implies that thermal energy should collect and become stuck there until it raises the temperature and eliminates the trough. That this does not occur seems to bother no one. But suppose we remove the hypothetical internal temperature gradient. What then? Why then we see that the sun’s bloated atmosphere and the “wrong-way” temperature gradient in that atmosphere point strongly to an external source of solar energy.”

— Ralph E. Juergens, (1972)



This stunning image shows remarkable and mysterious details near the dark central region of a planet-sized sunspot* in one of the sharpest views ever of the surface of the Sun. Along with

features described as hairs and canals are dark cores visible within the bright filaments that extend into the sunspot, representing previously unknown and unexplored solar phenomena. The filaments' newly revealed dark cores are seen to be thousands of kilometers long but only about 100 kilometers wide. Image courtesy of the Swedish Solar Telescope.

“The amazing zoo of structures and dynamic phenomena on the Sun are not well understood in general, though they have been observed for a very long time.”

—Dan Kiselman, Royal Swedish Academy of Sciences, [Institute for Solar Physics](#)



Ralph Juergens.

Simple observation shows the ordered granulation of the photosphere does not behave as expected of turbulent convection in hot hydrogen. The pioneer of the discharge model of the Sun, Ralph Juergens, wrote in 1979:

“The idea of turbulent convection delivering endless loads of energy upward from the unseen depths of the Sun conflicts not only with the ordered structure of the photosphere but also with the observable integrity of individual granules. The nodules of plasma appear, endure for some minutes, then fade away... Minnaert once published an analysis of photospheric behavior in terms of the Reynolds number. He found the critical value to lie near 10^3 . The actual Reynolds number of the photosphere, as calculated from observable characteristics of the plasma, turned out to be in excess of 10^{11} , which is to say, at least 100 million times greater than the critical value. Clearly, then, any convective motion in the photosphere should be violently turbulent and highly disordered, as Minnaert indeed pointed out. Practically in his next breath, however, Minnaert asserted that ‘The variable forms of the granules and their short lifetimes are evidence of nonstationary convection.’ Such an abrupt about-face is startling. Apparently Minnaert, himself, was disquieted; he immediately set out to minimize his non sequitur by suggesting ways and means for disregarding the classical theory of turbulence to make things come out right for the photosphere.”

—*Ralph E. Juergens*

Sunspots are dark instead of bright, which is prima facie evidence that heat is not trying to escape from within. And the Sun’s corona is millions of degrees hotter than the photosphere. These simple observations point to the energy source of the Sun being external. Add to this the dominant influence of magnetic fields on the Sun’s external behavior and we arrive at the necessity for an electrical energy supply. It is the “subtle radiation traversing space which the star picks up,” and which Eddington immediately dismissed because his gravitational model required energy to be generated at the core of the star to bloat it to the observed size.

“In seeking a source of energy other than contraction the first question is whether the energy to be radiated in future is now hidden in the star or whether it is being picked up continuously from outside. Suggestions have been made that the impact of meteoric matter provides the heat, or that there is some subtle radiation traversing space which the star picks up. Strong objection may be urged against these hypotheses individually; but it is unnecessary to consider them in detail because they have arisen through a misunderstanding of the nature of the problem. No source of energy is of any avail unless it liberates energy in the deep interior of the star.”

—A. Eddington, *The Internal Constitution of the Stars*.

Eddington's legacy to stellar physics has been a return to Ptolemaic science where endless 'epicycles' are added to theory in an attempt to save appearances.

It is now almost a century since the thermonuclear theory of stars was formulated. It is an urban myth. Science has many urban myths that have a life of their own. Such myths are difficult to dispel when eminent scientists promote them, educators parrot them, the media (<http://www.holoscience.com/news/img/Calling%20science%20to%20account.pdf>) dramatizes them, and students are discouraged from dissent.

“It is a strange thought, but I believe a correct one, that twenty or thirty pages of ideas and information would be capable of turning the present-day world upside down, or even destroying it. I have often tried to conceive of what those pages might contain, but of course I am a prisoner of the present-day world, just as all of you are. We cannot think outside the particular patterns that our brains are conditioned to, or, to be more accurate, we can only think a very little way outside, and then only if we are very original.”

—Fred Hoyle, *Of Men and Galaxies*

Our mental 'map' of the world is strongly influenced by the things we experience in our early years. Our formal education tends to set the patterns that we follow for the rest of our lives. But not so for everyone.

There are always those adventurous few who venture off the beaten path. For them, losing sight of landmarks can be exhilarating, but the difficulty of relating discoveries upon return can be high. Not least is the problem of dismissal by the “*specialized gate keepers*” of knowledge. Excessive institutionalisation may have made acceptance of new paradigms more difficult now than in Galileo’s time.

“We can only discuss or make intellectual advances by passing through the existing body of learning. This is such an enormous task, made even more enormous by the multitudes of specialized gate keepers, that no one can produce integrated thought.” “...we are faced by a crisis in language and communication. This crisis is being accentuated, not eased, by the Universities.”

—*J R Saul, The Unconscious Civilization*

Having a trailblazer’s map, like that provided by Ralph Juergens, is like having access to Google Earth while scientists puzzle over medieval maps with their rubric at the borders, “beyond there be dragons,” and where Terra Incognita is huge and “dark.” So it is the belief that the unknown depths of space are filled with “dark matter” and “dark energy” and all-devouring dragons or black holes. Modern astronomy is completely in the dark.

The standard theory of stellar interiors is the result of bad timing. It is an historical accident that is long overdue for investigation. But the history of ideas and scientific debates are rarely put in context for students. The losers and their arguments are minimized and forgotten. However, debates are rarely won on scientific grounds. Politics and personalities, then as now, play a major role. So the contests should be revisited occasionally to check the assumptions that were made. It should be compulsory before indulging in post-modern metaphysics; the idea that knowledge is constructed, not discovered. But it is rare today to see a scientific paper cite others more than a few years old. Notably, those few scholars who trouble to delve into historical scientific debates find the ‘truths’ they have been taught not so assured after all. It is often they who question the consensus view and find publication difficult as a result. The historical perspective required for healthy skepticism is lacking in science today.

When we assign names to theories — Newton's law of gravity, Einstein's theories of relativity— we impede progress by attaching ideas to celebrities. To question these theories is seen as an attack on the celebrity, with all of the attendant visceral responses to such an 'intrusion.' But the history of science shows that it is often an intruder's fresh ideas that eventually trigger the biggest advances. Dr. Bernard Newgrosh calls such intruders "eminent outsiders." His favorite example is none other than the astronomer William Herschel (1738-1822), *"who was born in Hanover, joined a regimental band at 14, went to England at 21 and worked as a musician and composer. He also instructed himself in mathematics and astronomy and constructing his own reflecting telescopes."* Another was Michael Faraday (1791-1867), who *"was born in Surrey, apprenticed to a book-binder and was largely self-educated."*

Newgrosh notes:

"how easy it used to be even for entirely self-taught outsiders and part-time amateurs to break into mainstream academia... Not only does this not happen in the modern world, where academia is distrustful of outsiders and its publications are by and large closed to non-members of the academic elite but the general perception is that if you have no academic qualification you cannot be recognized as having any expertise."

The Royal Society is a club that would reject a Herschel or Faraday today.

The Royal Society celebrates its 350th anniversary this year. The book, ***Seeing Further: The Story of Science and the Royal Society***, edited by Bill Bryson, is being released to honor the event. Robin McKie, science editor of the Guardian, in his review writes:

"The book is low, to the point of non-appearance, in human interest and is just a little bit too smug for its own good. Then there is the creeping feeling of worthiness that slowly envelops the reader, as you encounter, again and again, noble minds revealing the wonders of nature. It is like reading a piece of upmarket vanity publishing. I wanted to like it more but couldn't."

Human interest comes chiefly from reading about the clash of ideas and personalities in their proper historical context. This kind of adulatory book about scientists written by the usual publicity hounds is not the way to advance science. It reinforces the status quo and discourages dissent. It is boring and discourages student participation in science, as universities report with growing concern. To stop the rot requires that we challenge students with the idea that “a vast cosmical discovery” awaits the adventurous. And all of the arts and sciences will be profoundly influenced. What better motivation could educators offer students?

However, bringing about a fundamental scientific paradigm shift is arguably more difficult today than at any time in history. And nothing could be more difficult than to wring an acknowledgement that our cherished story of how the Sun and stars work is wrong, despite the disquiet expressed by experienced astrophysicists at their meetings. The following quotes are from a recent colloquium by a well-known astrophysicist and expert on stellar interiors:

“If we understand what is going on in the Sun, we can turn and look outwards to every other star and transfer that knowledge to those other stars.”

“The standard solar model predicts no motion in the photosphere. The solar surface is a mess.” “There is a gap in our understanding of stellar evolution. Some of the things we’re finding are not what we expected.” “The radii of some stars are out by ± 10 percent according to our models.”

Rapid change needs a metaphorical bushfire to sweep through the ‘old growth’ on our campuses. But what ‘firestorm’ could result from misunderstandings about the Sun? The contrived crisis of anthropogenic global warming (<http://www.holoscience.com/news.php?article=8pjd9xpp>) (AGW) may be a timely example. But AGW tends to be an unfalsifiable hypothesis in the short term. If you are buried in snow, the argument goes, it is AGW that is causing the “extreme weather.” We may have to wait for years before it becomes evident that the climate changes regardless of what we humans do. The cosmological fact is that the source of warmth, our Sun, is a variable star

(<http://www.holoscience.com/news.php?article=by2r22xg>). This was termed an “unorthodox idea (<http://www.physorg.com/print184603827.html>)” as recently as last week on the Solar Dynamic Observatory (SDO) website:

For some years now, an unorthodox idea has been gaining favor among astronomers. It contradicts old teachings and unsettles thoughtful observers, especially climatologists. “The sun,” explains Lika Guhathakurta of NASA headquarters in Washington DC, “is a variable star.”

However, with the short attention span of the media, science will probably ride out the inevitable failed prediction. The jungle of institutionalized and government funded science is more fire-proof than the major US banks in the worst of the global financial crisis. And the media is sycophantic toward academics to the point of being irrelevant.

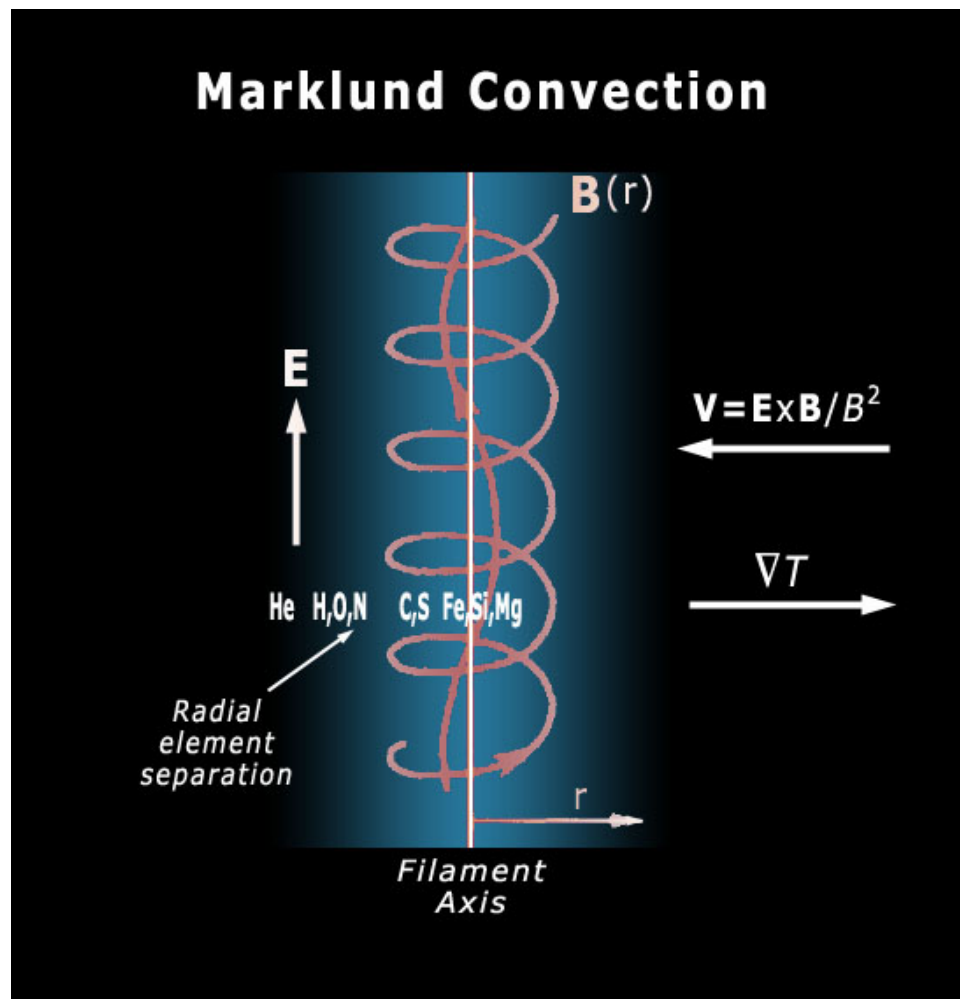
“I would assert that there are probably as many as twenty really major discoveries in physics which are waiting around for somebody to pick up and which involve no major facility. I would suspect that to have a major facility would be an active handicap, since it is usually the case that the facility dictates the scientist’s thoughts rather than the other way about.”

—*Fred Hoyle, Of Men and Galaxies*

Cosmic Electric Lights

The electrical model of the Sun discards the problematic birth of stars by gravitational accretion. Stars are formed following Marklund convection of charged particles in dusty plasma toward the axis of galactic Birkeland current filaments.

Marklund Convection



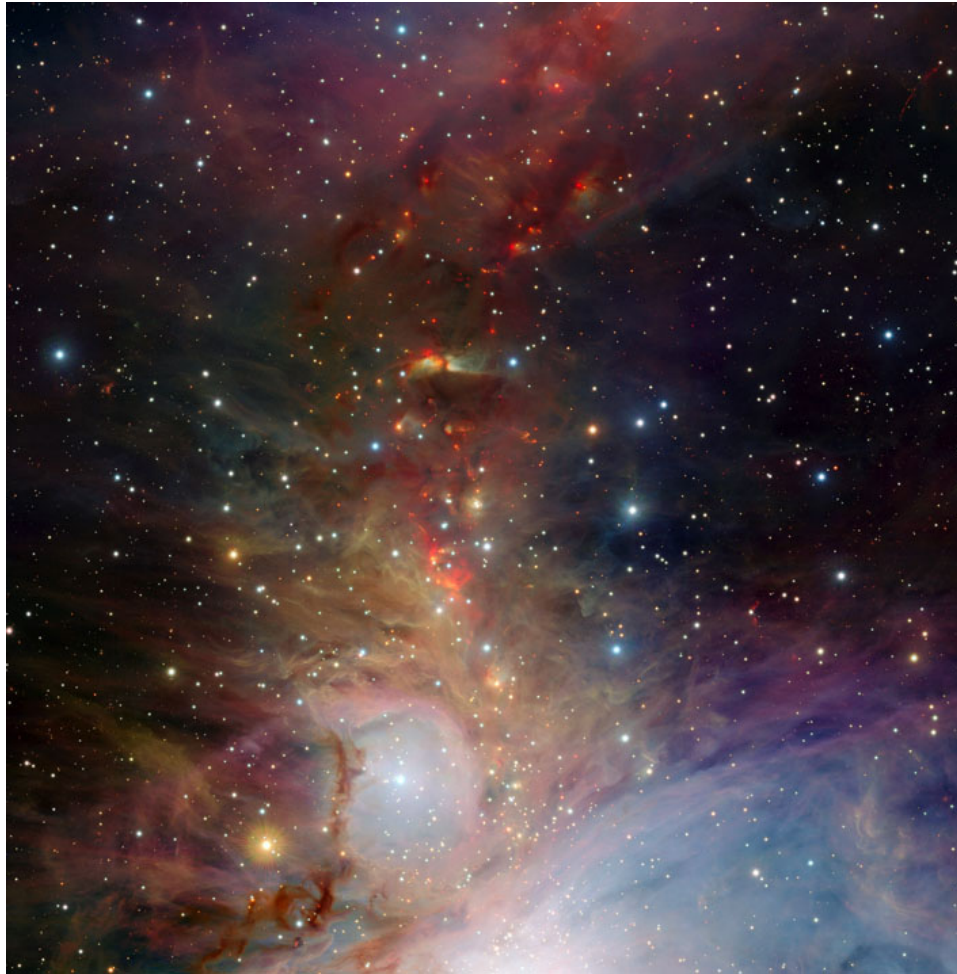
General form of the magnetic field line pattern in a force-free axisymmetric filamentary structure. The filament is transparent so the temperature decreases toward the axis due to a preferential cooling of the densest regions. So the ionized components of the plasma are convected inwards with a velocity V across a temperature gradient, ∇T . Diagram adapted from Marklund, G. T., "Plasma convection in force-free magnetic fields as a mechanism for chemical separation in cosmical plasma", *Nature*, vol. 277, Feb. 1, 1979, p. 370, 371.

It is a very efficient mechanism which results in scavenging matter with a long-range $1/r$ force. Marklund explains:

"In my paper in *Nature* the plasma convects radially inwards, with the normal $E \times B / B^2$ velocity, towards the center of a cylindrical flux tube. During this convection inwards, the different chemical constituents of the plasma, each having its specific ionization potential, enter into a progressively cooler region. The plasma constituents will recombine and become neutral, and thus no longer under the influence of the electromagnetic forcing. The ionization potentials will thus determine where the different species will be deposited, or stopped in their motion."

Stars formed in this way have an outer envelope of helium and hydrogen. Working inwards, hydrogen, oxygen and nitrogen will form the atmospheric middle layers, and iron, silicon and magnesium will

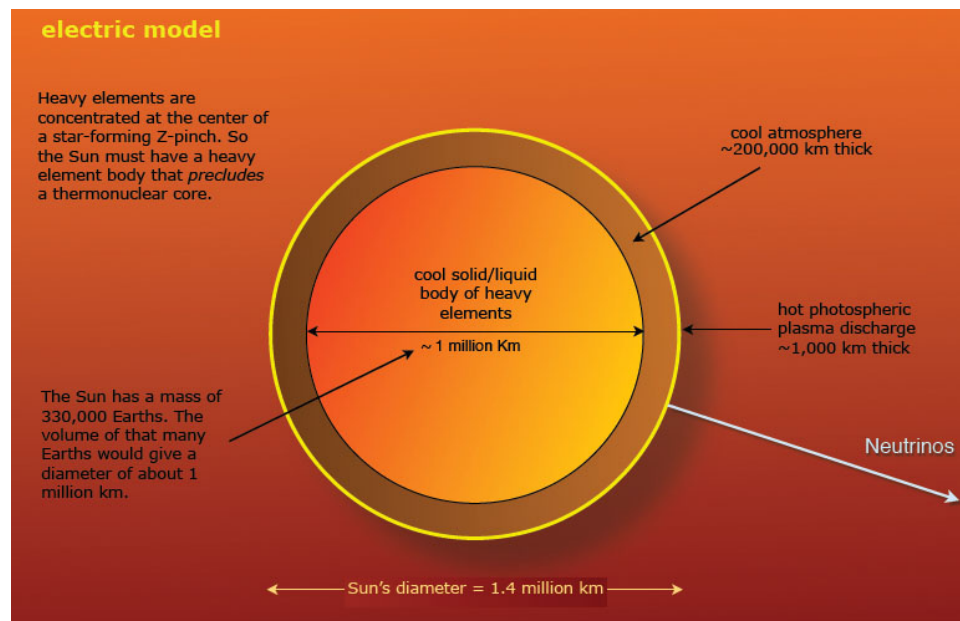
make up the core, which is cool. There is no thermonuclear engine in stars!



This infrared image of the Orion nebula* shows the new (red) stars forming along twisting current filaments in a dusty plasma. Credit: ESO/J. Emerson/VISTA & R. Gendler. Acknowledgment: Cambridge Astronomical Survey Unit.

Dr. Carl A. Rouse is called *"a quiet maverick of an astrophysicist whose 'nonstandard' models of the interior of the Sun have been provoking the solar physics community for nearly 40 years."* He found from his study of pulsating variable stars that there is something wrong with the standard model of the interior of stars. Using the usual assumptions he could not match the observed mass, luminosity and radius of the Sun! He found that his model worked only by assuming the Sun has a core of heavy elements. What is more, he can reproduce the observed helioseismic oscillations. Rouse's work deserves more attention because it fits the plasma cosmology story of star formation in a Z-pinch, with the heavy elements concentrated at the core. It also matches the ELECTRIC UNIVERSE® model of electric stars, where the solar neutrino deficit is no longer "one of the greatest unsolved problems of solar physics" because sunshine is a spherical electric discharge phenomenon powered by the galaxy. It explains simply why

the solar irradiance exhibits modulation identical to that of neutrinos. Nuclear reactions occur on the Sun like they do in atom smashers on Earth, by concentrating electrical energy onto a target.



This diagram is from The Sun e-book.* The simplistic estimate of the size of the body of the Sun is intended to show that the atmosphere of a star can contribute a substantial amount to its apparent size, given by the thin yellow photosphere.

In September last year the National Solar Observatory featured a news item, "Solar Polar Vortex?":

"Typically, the differential [solar] rotation shows speeds of rotation of about 2000 m/s near the Equator and about 1000 m/s near latitudes of 80 degrees. The differential rotation has undergone changes over surprisingly short periods of time. In short, the central latitudes have been somewhat constant, whereas the regions near the Equator and the poles have changed substantially in a semi-periodic fashion, which appears to be correlated with the solar magnetic cycle... The increases in spin appear to be short lived but occur during times of high magnetic activity. In a few cases, dramatic increases in spin approaching 400 m/s have occurred."

That is dramatic! So is the fact that this behavior of the Sun is not a surprise in the electrical model. Alfvén's circuit model of the Sun shows the current flow concentrated at the poles and the equator. The changes in the solar magnetic field are caused by changes in the electric current flowing through the Sun. The rapid changes in speed of the polar vortex are simply electrical atmospheric effects like those seen on the gas giant planets. In fact, since all polar atmospheric

vortexes are driven by rotating Birkeland currents (http://www.plasma-universe.com/Birkeland_current), similar odd features seen at Saturn and Venus (polygon (<http://www.holoscience.com/news.php?article=66b0jzyh>), hot spot vortex (<http://www.holoscience.com/news.php?article=1xz2g6tn>)) should someday be detected on the Sun.

The renowned solar astrophysicist, Eugene N. Parker, wrote in his Special Historical Review article in ***Solar Physics***:

“..the pedestrian Sun exhibits a variety of phenomena that defy contemporary theoretical understanding. We need look no farther than the sunspot, or the intensely filamentary structure of the photospheric magnetic field, or the spicules, or the origin of the small magnetic bipoles that continually emerge in the supergranules, or the heat source that maintains the expanding gas in the coronal hole, or the effective magnetic diffusion that is so essential for understanding the solar dynamo, or the peculiar internal rotation inferred from helioseismology, or the variation of solar brightness with the level of solar activity, to name a few of the more obvious mysterious macrophysical phenomena exhibited by the Sun.”

Such frank admissions should be a warning that scientists don't understand the Sun or stars at all. All of the problems can be put down to an invalid model. An outstanding clue is the *“intensely filamentary structure of the photospheric magnetic field,”* which is diagnostic of electric Birkeland currents impinging on the photosphere. Another clue is the even spacing of those magnetic filaments at the photosphere (current filaments impinging on an anode are spaced evenly apart). And the attraction between sunspots with the same magnetic polarity seals the argument (parallel electric currents attract).

A good measure of a theory is its ability to predict the outcome of new observations or explain them without introducing additional ad hoc concepts. Stellar theory fails this test miserably. For example, most stars are in binary or multiple systems (gravitational theory has problems with this too). So it is vital that stellar theory works for them. However, the theories of mass transfer between binary stars and their

resulting evolution give the wrong element abundances, even after all of the adjustable parameters are pushed to their limits. Our expert again:

“Something is clearly wrong.” “Some of the things we’re finding are not what we expected. We’ve all been carefully taught in the wrong way.” “We need theories that are not so infinitely flexible.”

Just so. Complexity does, however, provide security of tenure. It allows researchers to waste their talents and our money endlessly playing with computer models to approximate surprising new observations. The work is futile because it is not designed to make predictions whose falsification could end the game. There is no thought of any alternative to the thermonuclear model of stars. It is a self-perpetuating pastime. *“Even good scientists do GIGO (garbage in – garbage out). Astrophysicists have a long history of plugging in the answer they want to see.”* The “infinitely flexible” astrophysical theories are impossible to falsify. Cosmology at present is not real science.

Theoretical astrophysicists have missed something important in their education. They are taught a theoretical form of plasma physics involving frozen-in magnetic fields that was warned against by Hannes Alfvén as not applying in space plasma. They do not attend plasma science conferences comparing real plasma lab experiments with observations of cosmic plasma. They seem oblivious that there is an electrical engineering (IEEE) discipline of plasma cosmology. Like the stars, plasma cosmology has a bright future.

Countless billions of dollars have been wasted based on the thermonuclear model of stars. For example, trying to generate electricity from thermonuclear fusion, “just like the Sun.” The thought that solar scientists have it completely backwards has not troubled anyone’s imagination. The little fusion power that has been generated on Earth has required phenomenal electric power input, “just like the Sun!” The Sun and all stars **consume** electrical energy to produce their heat and light and cause some thermonuclear fusion in their atmospheres. The heavy elements formed there are seen in stellar spectra. It explains why the expected solar neutrino count is low and

anti-correlated with sunspot numbers. It explains why many stars are considered “chemically peculiar.” Get the physics right first and the mathematics will follow.

It is no surprise that ‘journeyman science’ and its spin-off technology advances more rapidly in the age of the Internet than in the past. But it comes as a shock that fundamental science is moribund. That doesn’t stop some scientists with more hubris than commonsense to declare a ‘theory of everything’ is within reach. Typical of this misguided age is the notion that such a theory will be found in a concise statement printable in arcane mathematical runes on a T-shirt. It reveals that perhaps the greatest problem for physics is the cult of celebrity attached to mathematicians and their consequent dominance of the field. Perhaps the worrying decline in interest in physics can be put down to the overemphasis on mathematical theory. The clash of philosophical concepts is far more intriguing and ultimately useful. Mathematics should be the cart behind the horse of physics, not the reverse. Mathematics describes actions, it cannot explain them. Mathematics is not physics!

“I am acutely aware of the fact that the marriage between mathematics and physics, which was so enormously fruitful in past centuries, has recently ended in divorce.”
—Freeman Dyson

As the astrophysicist said, *“If we understand what is going on in the Sun, we can turn and look outwards to every other star and transfer that knowledge to those other stars.”* But we have not even begun to understand the Sun or the universe we live in. We must wait to see who the real scientists are—those who respond wisely to the distress of encountering fundamental disagreement.

“Science is one thing, wisdom is another. Science is an edged tool, with which men play like children, and cut their own fingers.”
—Sir Arthur Eddington

Wal Thornhill

